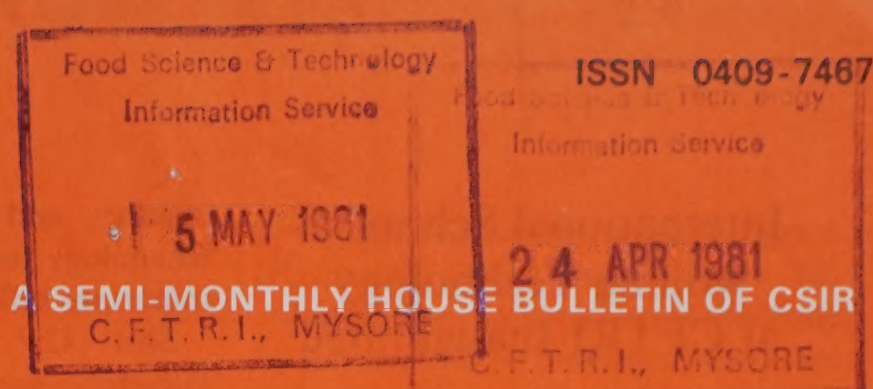




CSIR NEWS



VOL 31 NO 7 15 APRIL 1981

FICCI Award for RRL-Jammu

Regional Research Laboratory (RRL), Jammu, has been selected for the FICCI Award for the year 1980 in rural development. The FICCI awards are being given, since 1977, in recognition of individual, corporate and institutional initiative in economic, social and scientific development.

The 1980 award to RRL-Jammu is in recognition of its success in its 'Laboratory to Land' programme, which covers aquaculture, cultivation of low-volume high-value crops, mushroom cultivation, and development of non-toxic grain protectants.

Among the successful projects aimed specially at rural uplift are (i) utilization of solar energy for drying apricots (in Ladakh region) and chillies and other vegetables; and (ii) development of formulation for the control of lice and demonstration of its efficacy in villages. The laboratory's efforts have also aided cottage-scale industries and provided fruitful employment to villagers. The laboratory has, for instance, provided training in fur and wool technology and breeding of fur-bearing rabbits. □

Four CSIR Personnel on Science Advisory Committee

The directors of three CSIR laboratories have been included in the recently constituted Science Advisory Committee to the Cabinet (SACC), besides the Director General, Scientific and Industrial Research. They are: Dr

Nitya Nand, Central Drug Research Institute, Lucknow; Dr S.R. Valluri, National Aeronautical Laboratory, Bangalore; and Dr S.Z. Qasim, National Institute of Oceanography, Goa.

The committee will advise the government on the formulation of the science and technology policy and the manner of its implementation. It will also recommend measures for increasing the country's technological self-reliance, with particular reference to the Government's policy on foreign collaboration and import of technology, policy issues relating to the development and application of science and technology and organizational aspects of science and technology institutions.

Other functions include filling critical gaps in national competence, promoting technical cooperation among developing countries, and other issues concerning science in international relations.

With Dr M.S. Swaminathan, member, Planning Commission, as its chairman, SACC will have the following other members: Prof. M.G.K. Menon, Secretary, Department of Science and Technology (he is also the present Director General, Scientific & Industrial Research); Dr H.N. Sethna, Chairman, Atomic Energy Commission; Prof. Satish Dhawan, Secretary, Department of Space; Prof. B. Nag, Secretary, Department of Electronics; Scientific Adviser to the Defence Minister; Secretary, Department of Environment; Dr Raja Ramanna, Secretary, Department of Atomic Energy and Director, Bhabha Atomic Research Centre, Bombay; Prof. Rais Ahmed, Physics Department, Aligarh Muslim University; Prof.

Devendra Lal, Director, Physical Research Laboratory, Ahmedabad; Prof. C.N.R. Rao, Indian Institute of Science, Bangalore; Dr M.M. Sharma, University Department of Chemical Technology, Bombay; Shri K.P.P. Nambiar, Chairman and Managing Director, KELTRON, Trivandrum; Dr M.N. Dastur, Chairman-cum-Managing Director, Dastur & Co. (Pvt) Ltd, Calcutta; and Prof. Obaid Siddiqui and Prof. R.R. Daniel, Tata Institute of Fundamental Research, Bombay. The tenure of the present committee is up to 31 March 1983. □

Prof. M.G.K. Menon

Prof. M.G.K. Menon, Secretary, Department of Science and Technology, and Director General, Scientific & Industrial Research, has been appointed Chairman of the newly formed Commission for Additional Sources of Energy. □

IMC Award for CFTRI

The Central Food Technological Research Institute (CFTRI), Mysore, has won Shri Mathuradas Vissanji Endowment Award for the year 1979 of the Indian Merchants' Chamber, Bombay. □

Four National Laboratories Re-transferred to CSIR

Four national laboratories, viz. Central Fuel Research Institute, Dhanbad; Central Road Research Institute, Delhi; Central Building Research Institute, Roorkee; and Indian Institute of Petroleum, Dehra Dun, which among others had been transferred to user ministries/departments have been re-transferred to CSIR. □

International School of Milling Technology at CFTRI Inaugurated

Asia's first International School of Milling Technology (ISMT), an Indo-Swiss venture, was inaugurated at the Central Food Technological Research Institute (CFTRI), Mysore, on 25 February 1981 by Prof. M.G.K. Menon, Director General, Scientific & Industrial Research, and Secretary, Department of Science and Technology.

Thanking the Swiss government for its assistance in setting up the school, which is expected to train millers in India and in South and South-east Asian countries, Prof. Menon said that with the starting of ISMT at CFTRI, Indian students need not have to go to foreign countries for training in flour milling. The school would be open also to personnel from other developing countries. Prof. Menon said that only 15 years ago the country imported food, but now there was no need to import even processed food. Dedicated efforts of the Indian agricultural scientists had helped the nation become self-sufficient. Referring to energy crisis, he said that 10 years ago it was thought that energy was in abundance. But a time had come now to make maximum use of what was regarded as waste all these years. He hoped that it would be possible to deliver food to the consumer in the form in which he wanted it with a minimum amount of energy expended.

Presiding over the function, the Chief Minister of Karnataka, Shri R. Gundu Rao, described the school as a symbol of constructive international cooperation. Shri Gundu Rao said that post-harvest care played an important part in feeding the people. Proper transit and storage facilities and efficient milling were of vital importance, he added. The Chief Minister congratulated CFTRI on its record of research and service over the last 30 years.

The Swiss Ambassador, H.E. Etienne A. Suter, referred to the close cooperation between India and his

country and said the transfer of technology for the mill constituted an important milestone.

Shri C.P. Natarajan, CFTRI's Director, said that the Indo-Swiss venture was a result of an agreement entered into in October 1977 between the governments of India and Switzerland. It could offer a training mix specially adapted to the nation's and region's needs. The school had the latest machinery and techniques, and could be run fully on a commercial basis or exclusively for teaching purposes. It had a built-in facility to vary production pattern on a wide range. None of the existing flour milling institutes had such a wide flexibility, he added. □

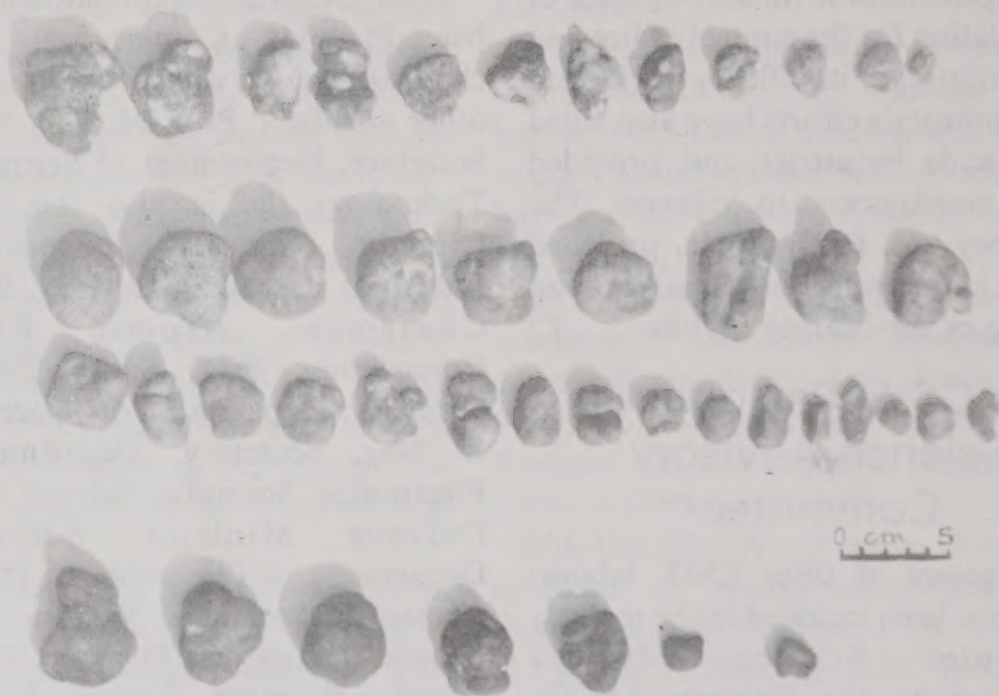
Polymetallic Nodules from Deep-Sea Floor

Polymetallic (manganese) nodules have been collected by the National Institute of Oceanography (NIO), Goa, under a programme of exploration of deep-sea mineral deposits in the Indian Ocean. NIO's R V *Gaveshani* collected the first sample of polymetallic nodules, during its 86th cruise, from a depth of 3.6 km on 20 January 1981. The cruise was led by Dr S.Z. Qasim, NIO's Director, with 15 scientists on board the vessel.

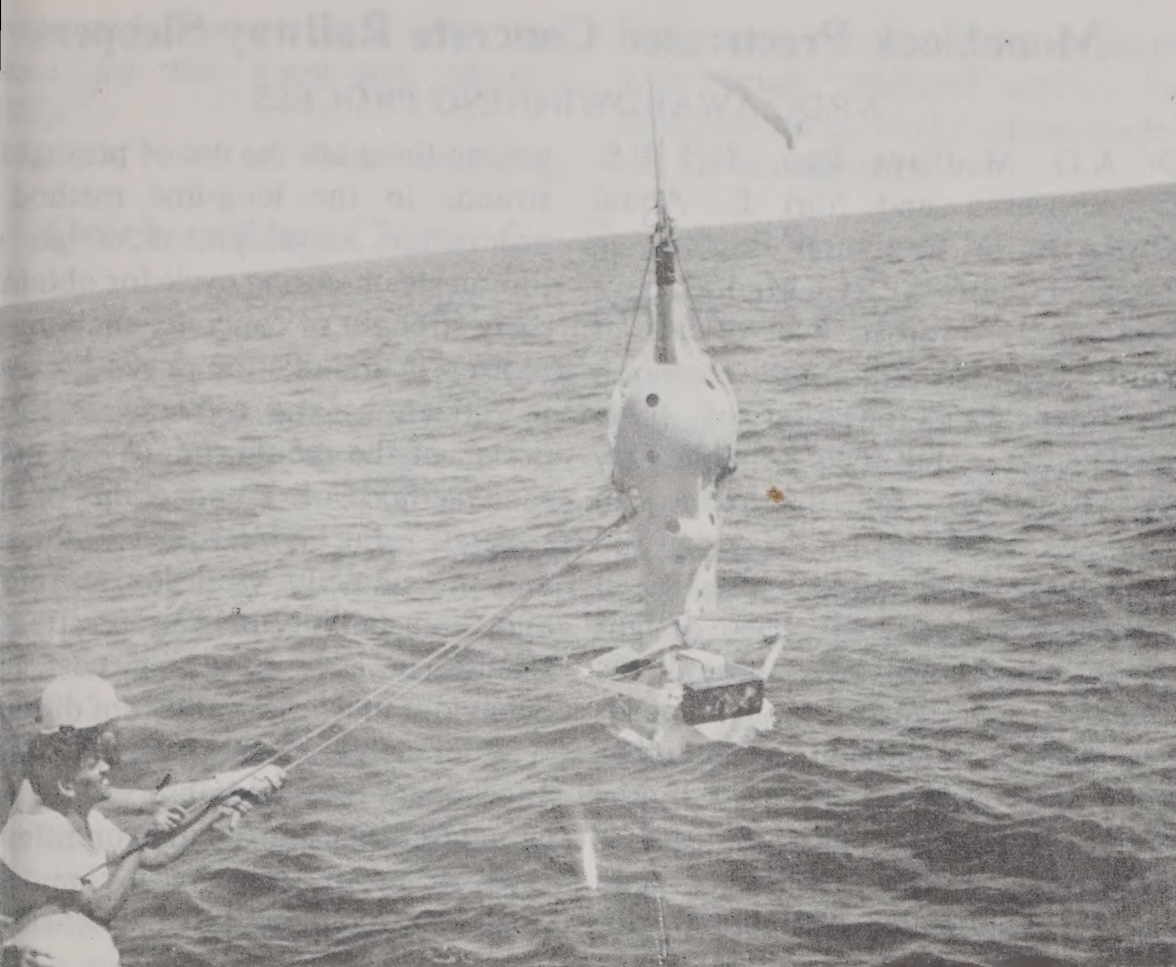
The nodules contain nickel, copper and cobalt, besides manganese and iron.

India is the seventh country in the world to have developed capability to collect polymetallic nodules from deep-sea floor, the other countries being UK, USSR, Japan, West Germany and France.

The occurrence of nodules in extensive areas in the oceans and their attractive metal content have led to detailed exploration and to the feasibility of their mining from the Pacific Ocean. Because of the high concentration of copper, nickel and cobalt, the polymetallic nodules will have the potential to replace the land deposits in the near future. Such is the economic importance of mining the nodules that the topic has received great attention at the UN Conferences on the Law of the Sea. The developed countries — UK, FRG, Japan and France — have formed a consortium and are investing large sums of money on the mining of nodules. Some prototype mining systems have already been designed and tested for collecting nodules from the Pacific Ocean. It is expected that within a few years, the nodules will be mined and perhaps the metal will be available in the market. The polymetallic nodules are dark grey to black and potato-shaped and are found in very large areas of the deep-sea. They occur from about 3.5 to 6 km depth range, and cover an area of about



Nodules collected by deep-sea grab and boomerang



Lowering of a boomerang grab

million square kilometres in the Indian Ocean, which is next only to the sea of the Pacific nodules. The average contents and ranges of various elements in the polymetallic nodules found in the Indian Ocean, according to available analyses, are as (per cent): Mn, 15.57 (5.2-37.0); Fe, 13.68 (1.2-37.0); Ni, 0.43 (0.07-1.55); Cu, 0.19 (0.009-1.36); and Pb, 0.18 (0.014-0.99).

During the 86th and 87th cruises, RV *Arvashani* carried out extensive shallow seismic profiling and magnetic surveys followed by sea-bed photography using a remote-controlled camera, and collected sea-bed samples using grabs, dredges and boomerang grabs. The vessel collected manganese nodules, ranging up to 8.3 cm in size and 200 g in weight, from a number of locations, ranging in depths from 3.6 to 4.5 km. The estimated concentration on the sea-bed ranges from 1 kg to 5 kg per m², which is considered to be very promising for mining. In addition to the nodules, the vessel obtained some baseline data for the physics, chemistry and biology of the deep sea, which will provide additional information on the impact of mining in the deep-ocean

environment. Encouraged by the results of this survey, the NIO scientists are planning to extend the survey of nodules to the other areas in the Indian Ocean, especially the central Indian Ocean, where large areas are reported to be carpeted with high-grade polymetallic nodules.

The exploration of deep-sea polymetallic nodules has been designated by CSIR as an All-India coordinated project in oceanography. With the collection of the nodules by NIO, the project enters into the second phase, under which the other CSIR laboratories will initiate researches on the mining, recovery, beneficiation and metallurgy of the nodules. □

Characterization of Phaseolus DNAs

Miss Malathi Seshadri, a research scholar from the National Council of Educational Research and Training, New Delhi, who worked in the Biochemistry Division of the National Chemical Laboratory, Pune, has characterized the DNAs of four *Phaseolus* species, namely black gram (*P. mungo*),

dew gram (*P. aconitifolius*), green gram (*P. aureus*), and French beans (*P. vulgaris*). The characterization was done by determining (i) melting temperature and buoyant density, (ii) content in repetitive DNA by studying the reassociation kinetics of sonicated DNA (550 nucleotide pairs), (iii) thermal denaturation properties and kinetic complexity of repeated DNA fractions, and (iv) arrangement of repeated and single copy sequences on the chromosomes.

The DNAs of all the four *Phaseolus* species resembled each other closely in T_m and buoyant density. The G+C contents as estimated from these two parameters were also similar, thus indicating the absence of 5-methylcytosine. The content of repetitive DNA ranged from 34 to 47% in the four *Phaseolus* species. The proportions of fast reassociating (up to cot 1) and intermediately reassociating (cot 1 to cot 50) DNA fractions also showed variations and appeared to be species specific. The haploid genome size was estimated from the cot ½ of the unique DNA and was found to vary from 0.36 pg to 1.6 pg. The repeated DNA sequences were observed to be unique as they exhibited a low percentage of base mismatching (3-5%) and, therefore, less sequence divergence; 64-75% of the cot 1 DNA consisted of one discrete frequency class of DNA sequences.

Modes of DNA sequence organization were studied in two *Phaseolus* species, namely *P. vulgaris* and *P. aureus*. The reassociation kinetics of the DNAs of increasing fragment length revealed that 60% of the genome consisted of interspersed repeated and single copy sequences. Hyperchromicity and S₁ nuclease resistance of the repetitive DNA fragments confirmed the occurrence of interspersion and yielded the average size of interspersed repeated sequences as 1925-1980 nucleotides in *P. vulgaris* and 2000-2350 nucleotides in *P. aureus*. As the lengths of the interspersed repeated sequences are significantly different from those in other plant species, the DNA sequence

organization patterns in French bean and green gram are considered to be unusual.

Miss Seshadri, who worked under the guidance of Dr P.K. Ranjekar, was awarded Ph.D. degree by the Poona University for her thesis based on the studies. □

Synthesis of Zearalenone and 1-Triacontanol

Shri M.N. Deshmukh, a senior research fellow, while working at the Organic Chemistry Division of the National Chemical Laboratory (NCL), Pune, has attempted the total synthesis of zearalenone and 1-triacontanol.

Zearalenone, an antibiotic with anabolic and uterotrophic activity, was the first macrolide to be synthesized by both Merk and Syntex groups. The synthesis of the desired aliphatic part has been achieved utilizing dihydropyran and 2-acetyl- α -butyrolactone as starting materials. The aromatic part was built starting from orcinol. The final condensation of the two parts for the total synthesis of zearalenone is in progress.

1-Triacontanol, a new plant growth regulator, is known to increase the yield of rice, tomatoes, barley, etc., and is marketed by Polyscience (USA) at an exorbitant price (\$ 360/g). Shri Deshmukh has synthesized this compound starting from stearic acid followed by two successive additions of six-carbon units through enamine reaction.

The research fellow also screened some medicinal plants belonging to the Rutaceae family and characterized spectroscopically a number of new and known alkaloids, lignans and coumarins isolated from these plants.

For his thesis based on these studies Shri Deshmukh was awarded the Ph.D. degree in organic chemistry by the University of Poona. Shri Deshmukh worked under the guidance of Dr A.V. Rama Rao. □

Monoblock Prestressed Concrete Railway Sleepers

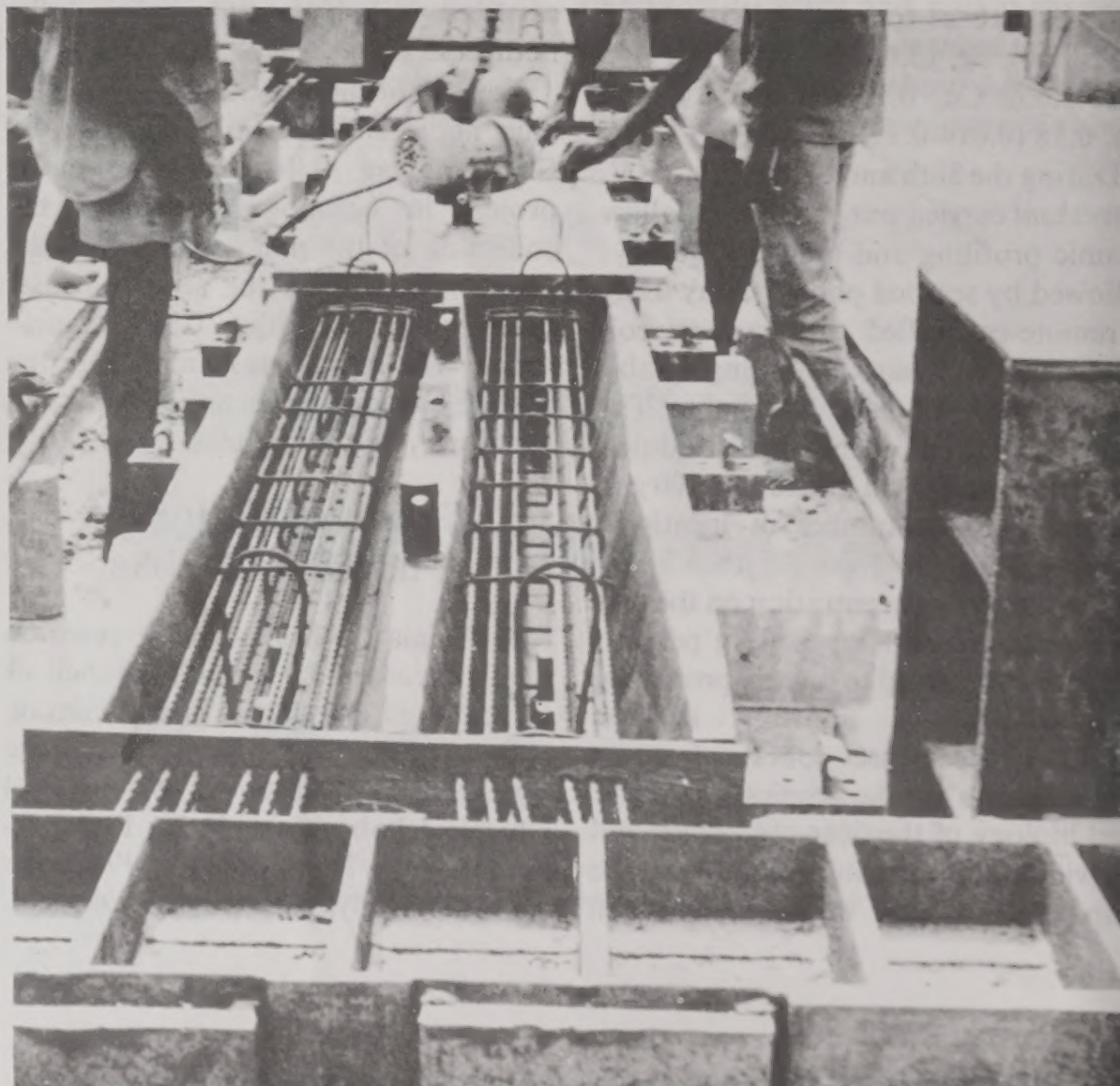
NRDC AWARDWINNING PROCESS

Dr A.G. Madhava Rao, Shri V.S. Parameswaran and Shri E. Abdul Karim of the Structural Engineering Research Centre (SERC), Madras, have been jointly awarded a certificate of merit by the National Research Development Corporation of India (NRDC), as part of their Republic Day Awards (1981), for developing an improved technology for the design and production of monoblock prestressed concrete railway sleepers. These designs are an improvement over those of the Research, Designs and Standards Organisation (RDSO), Lucknow. The major improvements achieved in the design of sleepers are: (i) use of prestressing strands in place of plain wires, (ii) elimination of the mild steel stirrups in the central portion of the sleepers, and (iii) increase in the magnitude of prestressing force on the basis of estimation of actual losses in prestress. Several innovations and modifications have been made in an effort to improve the production of sleepers on a large scale. Prominent

among these are the use of prestress strands in the long-line method production, development of an optimum steam-curing cycle for obtaining early strength of concrete, enabling re-use of moulds on a 24-hr cycle, modifications and refinements to design of the mould, improvements in the method of compaction of concrete using high-frequency vibration and pressure-cum-vibration technique and bulk-pulling of the prestress strands to save time and cost. The behaviour of a large number of different types of sleepers under static, dynamic and impact tests was observed and actual transmission lengths for different types of prestressing steels commonly used in the manufacture of pretensioned sleepers was assessed.

The sleepers were cast on a long-line bed and under the simulated conditions prevailing in a full-fledged precast factory.

Sleepers based on the improved design and production techniques are now being manufactured by J



A view of the casting of prestressed concrete railway sleepers on pretensioning bed

stressed Products Ltd, who have
en up the know-how through
RDC.

RDSO, based on whose technology

prestressed concrete railway sleepers
were being produced earlier, have
incorporated the modifications made by
the SERC scientists. □

workmen. On an average, a crew of
three can fix six wooden crossbars using
clamps as against only two crossbars
with the conventional method. Also,
these supports are not affected by
blasting. The clamps can be recovered
and re-used several times. The design of
the clamp has been released to
21 firms. □

Quick-setting Clamp for Crossbar Support in Mines

NRDC AWARD WINNING PROCESS

ri N.M. Raju and Shri L.M. Prasad of
Central Mining Research Station
(MRS), Dhanbad, have jointly won
e Republic Day Awards (1981) of the
ational Research Development
orporation of India, comprising a cash
ize of Rs 10,000, for developing a
ick-setting clamp for crossbar sup-
rt in mines.

In coal-mines, a majority of accidents
e to roof fall occurs close to the
orking face. Wooden crossbars are
enerally used for roof support in
velopment workings. The conven-
onal method of fixing the crossbar
upport involves cutting of hitches on
e sides of pillars. This is time-
onsuming as it is done manually. Also,
e supports lag behind the working
ces exposing workmen to unsup-
ported roof. The clamp designed by the
MRS scientists helps fix the crossbar

support quicker and also minimize risks
to miners due to roof fall. The clamps
are fixed in holes (60 cm depth) drilled
on both sides of the pillar. Over a set of
two clamps, a wooden crossbar can be
set and tightened against the roof by
means of wooden wedges within 15 min.

The clamp consists of two mild steel
rods (diam. 32 mm, length 70 cm)
passing through holes drilled in an angle-
iron of 75 × 75 × 6 mm section and
250 mm length. The holes (diam. 35 mm)
are drilled 175 mm apart. Over the
angle-iron, a semicircular bracket made
of mild steel flat (50 × 5 mm) is welded to
keep the wooden crossbar in position.
Instead of the wooden crossbar, a steel
beam can also be set using a rectangular
bracket.

This support system has been
introduced extensively in coal-mines
and has been widely accepted by

Deputation Briefs

Dr P. Banerjee of Time & Frequency
Section of the National Physical
Laboratory, New Delhi, visited USA
from 1 to 19 December 1980 to attend
the twelfth annual Precise Time and
Time Interval (PTTI) Applications and
Planning Meeting at Greenbelt,
Maryland.

At the PTTI meeting, Dr Banerjee
presented two papers entitled 'Precise T
& F intercomparison between NPL
(India) and PTB (Federal Republic of
Germany) via satellite Symphonie-1'
and 'Precise T & F intercomparison via
VLF phase measurements'. The papers
covered the very important works done
by NPL in the field of time and
frequency. At the meeting Dr Banerjee
initiated discussions on problems
specific to the Indian subcontinent and
developing countries. Indian partici-
pation for the first time in PTTI meeting
was much welcome particularly in view
of the noteworthy achievements in
recognition of which NPL was elected a
member of the Consultative Committee
on the Definition of Second (CCDS).

Dr Banerjee visited the U.S. Naval
Observatory, Washington, to survey its
activities, particularly in time and
frequency services. He had an in-depth
discussion with a team of scientists
which included Dr G.M.R. Winkler,
Director, Time and Frequency Service,
Dr G. Hall, Deputy Director, Dr W.J.
Klepczynski and other senior scientists.

Dr Banerjee also visited the time and
frequency section of National Bureau of
Standards (NBS), Boulder, Colorado, to
get an overview of state-of-the-art of
R&D activities in this direction. He had
talks with Dr James Barnes, Chief, NBS
Time and Frequency Division, Dr



Wooden crossbars fixed on quick-setting clamp support

David W. Allan and Dr R.E. Beehler, chief project coordinators and other researchers regarding the present-day need and future trends of work in this field. While at NBS Dr Banerjee gave a talk on 'Time and frequency work in India'. The Indian work relating to HF services, VLF monitoring and, particularly, time transfer experiments via satellite and related programmes proposed was greatly appreciated by NBS experts. □

* * *

Shri Pritpal Singh Anand of the Central Salt & Marine Chemicals Research Institute, Bhavnagar, visited West Germany from 7 June 1979 to 17 February 1981 on a German Academic Exchange Service fellowship. In Germany, he worked with Prof. Dr W. Heitz of the Institute for Polymer Chemistry, Philipps-Universität, Marburg, West Germany. The work carried out by him pertained to the synthesis and characterization of block copolymers based on styrene-methyl acrylate, styrene-butyl acrylate, styrene-vinylmethylacetamide and methyl acrylate-vinylmethylacetamide.

These copolymers have better properties as compared to random copolymers and can be used in reverse osmosis, electrodialysis membrane preparations and in ion-exchange resin synthesis. □

Prof. Nurul Hasan Visits CECRI

Prof. S. Nurul Hasan, Vice President, Council of Scientific & Industrial Research, visited the Central Electrochemical Research Institute (CECRI), Karaikudi, on 17 February 1981. Prof. Hasan went round the laboratories and witnessed the various projects in progress.

Addressing the CECRI staff, the CSIR Vice President complimented the laboratory for its contributions to the growth of electrochemical industry. It was but natural for the country to expect more and more from such an organization in solving the problems related to energy crisis, corrosion, pollution, etc., he added.



Prof. S. Nurul Hasan addressing the CECRI staff; seated on his right is CECRI's Director Dr H.V.K. Udupa

Prof. Hasan declared open an annexe to the laboratory's main building. He also released *Corrosion Bulletin* started by CECRI. □

THEORETICAL GEOPHYSICS AND STRUCTURE OF THE EARTH'S INTERIOR

BHATNAGAR PRIZEWINNER DR NEGI'S WORK*

Dr. Negi's important contributions include the discovery of the phenomenon of 'negative electromagnetic screening' in geoelectromagnetics,



which suggests the possibility of superdetection of hidden metallic deposits (inhomogeneous and surrounded by moderately conducting

*Dr Janardan G. Negi, Area Chairman of Theoretical Geophysics at National Geophysical Research Institute, Hyderabad, has been named recipient (along with Dr B.K. Sahu) of the Shanti Swarup Bhatnagar Prize for 1980 in earth sciences. [CN, 31 (1981), 1].

zones). He has formulated laboratory model experiments to support the idea. His new and elegant solution of scattering (in frequency and time domain) by a radially inhomogeneous cylinder is considered a classic work in modern electromagnetic theory and has found sophisticated applications in the study of meteor trails, communication with high-speed re-entering (Skylab type) space vehicles, and microwave diagnosis of inhomogeneous plasma columns. He has contributed to the problem of precise radio-location of trapped coal-miners, thus enabling the long-wavelength radiowave communication in the anisotropic coal-mines. In the field of oil prospecting, he and his colleagues have developed a symmetric matrix method for automated gravity data interpretation and a formula to set the limits of analytic continuation of the geophysical data. The ambiguity in interpretation of the alternative inhomogeneous models has been quanti-

vely assessed by using the concept of channel capacity. Further, a new concept of non-linear transparency of seismic pulse shapes has been developed which is useful in the study of dynamic characteristics in seismic prospecting for information. Information theory concepts have been applied to generalize Wiener filter and maximum entropy methods for signal processing of multi-channel complex data.

Another frontier area which has drawn the attention of Dr Negi and his colleagues deals with the structure of regional inhomogeneities. A three-dimensional stochastic gravity disturbance model to interpret satellite and airborne gravity data using spectral analysis has been proposed. A lateral seismic velocity gradient approach has been suggested for predicting high-magnitude earthquakes in unstable seismic zones. A new hypothesis for the existence of hidden rift valleys beneath the Deccan Traps has been advanced and a unique 3-level aeromagnetic survey experiment has been conducted to study the deep structure of the flood basalts region. The effect of laterally inhomogeneous anisotropic conditions in the regionally complex zones of the colliding plates (e.g. in Himalayan region) has been calculated to arrive at realistic estimates of crustal and lithospheric depths from seismic surface waves and magnetotelluric studies, respectively.

The global problems of evolution and movements of crustal plates deal with different kinds of non-uniformities and synthesis of information from multi-disciplinary sources of data. The important question of gradual or episodic movement of crustal plates has been attempted by applying Feynman diagrams to study the theoretical possibility of quantum changes in the patterns of movement (as inferred from geomagnetic measurements) of the southern continents. The thermodynamic inhomogeneities have a crucial role as the cause of crustal movements and to describe the state of evolution of the various earth components. A new

hypothesis of thermal evolution and temperature profile of the lithosphere has been advanced in place of the prevailing hypothesis of dominant contributions of crustal radioactivity in continental heat flow by re-interpreting the classical heat-flow and heat-generation equation. By relaxing the sphericity condition in the classical spherical models of 400 km mantle discontinuity, the conductivity and temperature discontinuities at different depths in the upper mantle have been re-estimated. In order to understand the geomagnetic secular variation, a new mechanism has been proposed for the dissipation of magnetohydrodynamic waves generated in the fluid core of the earth.

All these conceptual developments and his pioneering efforts dealing with the main theme of multi-field response of inhomogeneities and non-uniform processes of the earth's interior have led to new insights and a unified mathematical approach to different complicated problems of the physics of the planet earth and mineral exploration.

Dr Negi (born in 1936 at Khirgaon, Madhya Pradesh) obtained his B.Sc. in 1956 and M.Sc. (physics with electronics) in 1958 from Agra University; he obtained his Ph.D. degree in exploration geophysics from Indian Institute of Technology, Kharagpur, in 1962. At NGRI and IIT, Kharagpur, he was the principal investigator for many Indo-US collaborative research projects. In March 1964 he founded the country's first Theoretical Geophysics Group at NGRI. He was a Visiting Fellow at the Cooperative Institute for Research in Environmental Sciences, University of Colorado, USA, in 1968-69; and a Visiting Professor in Geophysics at federal universities of Bahia and Para, Brazil, from 1975 to 1977. He has published 130 research papers and supervised the Ph.D. work of 20 research workers in India and Brazil. He has extensively lectured in several universities in USA, Canada, France, Hungary, and Brazil. He edited the proceedings of a seminar on Solid

Earth Geophysics and coauthored a technical report of the Indo-US project on Geophysical Studies on Deccan Traps.

Dr Negi has been a member of the working group on Properties of the Earth's Interior of the International Geodynamics Commission (1972-79), member of the consulting editorial board of *Pure and Applied Geophysics* (since 1974), editor of *Geophysical Research Bulletin* (1972-77), and member of European Association of Earth Science Editors (1973-75); he was national coordinator (NCST) for environmental sciences. He is a life member of American Geophysical Union; member, Society of Exploration Geophysicists (USA); fellow, Geological Society of India; fellow, Association of Exploration Geophysicists; and fellow and vice president of Indian Geophysical Union. He was elected fellow of Royal Astronomical Society, London (UK), in 1979. He is also recipient of the Krishnan Gold Medal (1973) of the Indian Geophysical Union. □

PATENTS INFORMATION

Indian Pat. 16/Del/78*

A process for the preparation of new yellow isothiazolanthranyl triazine disperse dyes for polyester fibres

N.R. AYYANGAR, R.J. LAHOTI & D.R. WAGLE
National Chemical Laboratory, Pune

The patent covers the preparation of new yellow isothiazolanthranyl triazine dyes by the reaction of 5-amino-1,9-isothiazolanthrone with cyanuric chloride. The resultant 2-(1',9'-isothiazolanthranyl-5'-amino)-4,6-dichloro-1,3,5-triazine is further treated with excess of mono- and dialkylamines, alcohols, 2-ethanolamine, morpholine or piperidine to give yellow disperse dyes.

These dyes can be applied to polyester fibres by thermofixation and are characterized by their brightness and good fastness properties. □

*Accepted

PERSONNEL NEWS

Appointments/Promotions

Dr K.P. Krishnamoorthi

Dr K.P. Krishnamoorthi of the National Environmental Engineering Research Institute (NEERI), Nagpur, has been promoted, on assessment, as Scientist EI (1 May 1979).

Dr Krishnamoorthi (born 14 June 1930) obtained B.Sc. (Honours) and M.Sc. degrees in zoology from Annamalai University in 1953 and 1955 respectively. From 1956 to 1959, he worked as senior research scholar in the Department of Zoology and Marine Biology of the same university. In 1959 Dr Krishnamoorthi joined NEERI. Deputed in 1966 to West Germany's Bonn University under WHO Exchange Workers' Grant, he worked on the biological characteristics of water quality. As head of Biology Cell and subsequently of Ecology & Ecosystems Division, he has specialized in pollution and environmental biology. His research interests include biological indicators of pollution, aquatic bioassay tests, and utilization of domestic wastewater through aquaculture and agriculture. He has published over 68 papers.

Dr Krishnamoorthi was awarded Ph.D. degree by Nagpur University in 1970 for his work on ovaries and pituitaries of some Indian fish. He is a recognized Ph.D. guide in zoology of that university. He is a member of the editorial board of *Indian Journal of Environmental Health*, and of *Academy of Environmental Biology, India*. □

Dr J.S. Dwivedi, Assistant Editor (Hindi), Publications & Information Directorate, New Delhi, has been promoted, consequent on assessment, as Editor (29 Sep. 1979).

At the National Geophysical Research Institute (NGRI), Hyderabad, the following have been promoted consequent upon five-year assessment: Shri M. Thangarajan (Scientist C, 22 Jan. 1980); Dr V. Divakara Rao (Scientist C,

6 May 1980); Shri A. Mahadevan (Scientist C1, 30 July 1980); Shri K.N. Nagabhushana Rao (Scientist C1, 24 Sep. 1980); Shri S.C. Jain (Scientist C1, 30 Sep. 1980); Shri Lloyd D'Silva (Scientist B1, 1 June 1980); Shri D.S. Bhaskara Rao (Scientist A, 1 March 1980); Shri Y.N.T. Seshagiri Rao (Scientist A1, 1 Jan. 1980); and Shri S.N. Swamy (Scientist A1, 12 July 1980).

Smt E.C. Malaimani and Shri M. Purushottama Sarma have been appointed Scientist B at NGRI with effect from 21 and 22 January 1981 respectively.

Appointments at the National Chemical Laboratory (NCL), Pune, include those of Dr A.J. Varma (Scientist C, 10 Dec. 1980) and Dr D.N. Kohirsagar (Scientist B, 1 Dec. 1980).

Dr A.S. Khanra has been appointed on promotion Scientist B at NCL (1 Aug. 1980). □

Engineering Talk

The Mechanical Engineering Research and Development Organisation (MERADO), Ludhiana, has started a quarterly house bulletin entitled *Engineering Talk*. The bulletin carries news relating to technical developments, and consultancy and testing work of MERADO. It also carries technological tips for the benefit of small and medium scale industries in the region to aid productivity, cost reduction, standardization, and quality control.

The first issue of the quarterly (January 1981) has been published.

The bulletin can be had from: The Scientist in charge, MERADO, Gill Road, Ludhiana 141006. □

Dr V. Subrahmanyam Commemoration Day

The Central Food Technological Research Institute, Mysore, celebrated its founder-director Dr V. Subrahmanyam Day on 30 January 1981. Prof. P.V. Sukhatme of

Maharashtra Association for Cultivation of Science, delivered commemoration lecture on 'Sto Indira Community Kitchen—La Single Experiment in Food Techno in which the speaker visualized a role for the community kitchen tackling the food problem of areas of the country.

Obituary

Shri B.N. Sastri

Shri B.N. Sastri (75), the first Editor of the Publications Information Directorate, New D passed away on 13 March 1981 Mysore.

Shri Ballapinni Nanjunda Sa association with CSIR dated back to very inception of the Council in when he started the *Journal of Science & Industrial Research* (JSIR) in response to a call from CSIR's founding Director Dr S.S. Bhatnagar. Backed by research, teaching and science journalistic experience, Shri Sastri soon established JSIR as the country's premier science periodical. In 1949 he took over concurrently, as editor in chief of *Wealth of India: A Dictionary of Indian Raw Materials and Industrial Products*, which, under his able stewardship, attained the reputation it now enjoys as the most authentic encyclopaedic publication on India's natural wealth. His lasting contribution was to bring under one fold the CSIR's journal and encyclopaedic publication units and to provide a shape and structure to the Directorate as a consequence of which PID has emerged as a leading science publisher in the country.

An M.Sc. and A.I.I.Sc., Shri Sastri was a research biochemist in his right and had established his credentials as a science editor with *Current Science* before he joined CSIR. He retired from CSIR in 1963.

As observed at a condolence meeting held at PID on 13 March, Shri Sastri's passing away is a tremendous loss to the science publishing profession.